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MEMORANDUM SITE 1 SOIL LEVEL DELINEATION FINAL ABL ROCKET CENTER WV
10/16/1998
CH2MHILL

Site 1 Soil Level Delineation - Final

TO: Dawn Hayes/LANTDIV
Tom Bass/WVDEP
Bruce Beach/USEPA
Dave McBride/Alliant
Lou Williams/NAVSEA

FROM: G. Brett Doerr

DATE: October 16, 1998

This memorandum updates the *Site 1 Soil Sampling* memorandum (September 21, 1998) and finalizes the scope and objectives of the sampling effort, which are threefold. The first objective is to address the question of whether polychlorinated biphenyls (PCBs) were disposed of at Site 1. The second objective is to better delineate the area of volatile organic carbon (VOC)-contaminated soil above the cleanup level in an effort to more accurately quantify the volume of soil requiring remediation. This information will be used during preparation of the Site 1 Feasibility Study. The third objective is to provide site-specific total organic carbon (TOC) data that will be used in establishing the soil clean-up level for VOCs and finalizing the *Preliminary Remediation Goals for Site 1 Soil and Establishment of Background Conditions* memorandum (October 18, 1996).

Table 1-1 summarizes the number of soil samples and associated analyses selected to satisfy the objectives stated above. Figures 1-1, 1-2, and 1-3 display the proposed sample locations as well as the estimated areas of soil concentrations above preliminary remediation goals (PRGs).

Table 1-1
Soil Sample Analyses
Site 1 Soil Level Delineation
Allegany Ballistics Laboratory
Rocket Center, West Virginia

Constituent	Analytical Method	Number of Samples	QA/QC Samples
TCL VOCs	USEPA CLP Organics SOW, OLM03 or latest version	64	0
TCL PCBs	USEPA CLP Organics SOW, OLM03 or latest version	7	5*
TOC	415.2/9060	12	0

* one duplicate (soil), one MS/MSD (soil), one field blank (aqueous), one equipment blank (aqueous)

The following laboratories will be considered for providing analytical services for the Site 1 Soil Level Delineation. The laboratory location and current certification or approval are also listed:

Quanterra Incorporated; North Canton, Ohio; current Naval Facilities Engineering Service Center (NFESC) approval and current EPA contract laboratory program (CLP) certification

CEIMIC Corporation; Narragansett, Rhode Island; current NFESC approval and EPA CLP certification

Envirosystems; Columbia, Maryland; current EPA CLP certification and current Army Corps of Engineers certification

In addition, the analytical method for TCL PCBs used by each laboratory achieves a detection limit below the minimum residential risk-based concentration (RBC) of PCBs in soil of 0.32 mg/kg. The standard detection limit for PCBs under the method listed in Table 1-1 is 0.033 mg/kg. This detection limit may change with increasing moisture content.

Background information on Site 1 and soil sampling rationale are presented in the *Work Plan for the Focused Remedial Investigation/Feasibility Study for Site 1 at the Allegany Ballistics Laboratory Superfund Site* (October 1994). All Site 1 Soil Level Delineation sampling activities will be conducted in accordance with the *Sampling and Analysis Plan for the Focused Remedial Investigtion/Feasibility Study for Site 1 at the Allegany Ballistics Laboratory Superfund Site* (October 1994).

To satisfy the first objective of the sampling effort, seven soil samples will be collected at several Site 1 locations and analyzed for Target Compound List (TCL) PCBs. The samples are located within known or suspected waste disposal areas along the river where previous sampling has indicated the presence of VOCs. Because no documentation exists indicating the use or disposal of PCBs at Site 1, the areas of high soil-VOC concentrations are believed to be the most likely locations to detect PCBs, if present. As shown in figures 1-1 through 1-3, three samples are proposed in the vicinity of the west end of the burning ground, one in the vicinity of the east end of the burning ground, two adjacent to the former drum storage area, and one within the inert burn area. All seven samples will be collected from 0.5 to 1 foot below ground surface (bgs) because it is assumed that if present, the PCBs likely were released to the ground surface and because they are stable compounds which do not readily degrade.

In order to satisfy the second sampling effort objective, a total of 64 samples will be collected from 41 locations for TCL VOC analysis. The proposed sampling locations were selected to be adjacent to the estimated areas above the VOC PRG of 152 µg/kg in order to better delineate these areas and volumes of soil potentially requiring remediation. As shown in figures 1-1 through 1-3, surficial soil samples will be collected for VOC analysis from all 41 locations. It is proposed that the surficial samples be collected from 2 to 3 feet bgs because the samples are to be analyzed for volatiles. At 23 of the 41 locations, an additional VOC soil sample will be collected from 4 to 6 feet bgs and at 4 of the locations, a deep soil sample will be collected from 8 to 10 feet bgs.

Twelve soil samples for TOC analysis are proposed for addressing the third objective. The twelve samples will be collected from four locations, as shown in Figure 1-1. The four

locations were selected from areas anticipated to be close to the cleanup level (i.e., 150 to 200 µg/kg), because these areas will be representative of soil containing the highest levels of VOCs. Three samples will be collected at each location from depths of 1 to 2 feet bgs, 4 to 6 feet bgs, and 8 to 10 feet bgs). The analytical results will be averaged for each borehole to provide a representative TOC value for the vadose zone.

All soil samples for PCBs analysis will be collected using a stainless-steel hand auger. All other soil samples will be collected using direct-push sampling techniques (i.e., Geoprobe®). Dedicated equipment (e.g., acetate liners) and proper decontamination procedures will be employed between sampling locations to ensure generation of representative data.

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CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
1,2-DCE	2.3	0.828	0-6

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	230	0.152	0-6

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	230	0.152	0-6

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
1,2-DCE	24	0.828	0-4

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	64	0.152	0-4

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	0.310	0.152	0-10

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	0.160	0.152	0-10

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	0.310	0.152	0-10

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
METHYLENE CHLORIDE	0.012	0.011	0-10

CONSTITUENT	MAX. CONC. (PPM)	1GW6 (PPM)	DEPTH (FT)
1,1-DCE	0.190	0.110	0-10

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
METHYLENE CHLORIDE	0.027	0.011	0-10

NORTH BRANCH POTOMAC RIVER

ALLEGANY COUNTY MARYLAND
MINERAL COUNTY WEST VIRGINIA

WESTERN MARYLAND RAILROAD (ABANDONED)

GATE

GATE

GATE

GATE 7

1GW10 1GW11

1GW13 1GW8 1GW3 1GW4

UNDERGROUND GASOLINE STORAGE TANKS

SEWAGE LIFT STATION

PARKING AREA

PIT 1 PIT 2 PIT 3

LOADING

225 815 224 148 344 291 75

N

0 50 100 150
SCALE IN FEET

LEGEND

- △ PCB SOIL SAMPLE (COLLECTED 0.5-1 FOOT bgs)
- ⊗ VOC SOIL SAMPLE (COLLECTED 2-3 FEET bgs)
- ⊗ VOC SOIL SAMPLES (COLLECTED 2-3 AND 4-6 FEET bgs)
- ☢ TOC AND VOC SOIL SAMPLES (TOC SAMPLES COLLECTED 1-2, 4-6, AND 8-10 FEET bgs) (VOC SAMPLES COLLECTED 2-3 AND 4-6 FEET bgs)

LEGEND

•15	TCE CONCENTRATION (ug/kg) IN SOIL SAMPLE. CONCENTRATION SHOWN IS HIGHER OF ONSITE AND OFFSITE ANALYSES, WHERE APPLICABLE.
•33/13	SOIL SAMPLES CONTAIN TCE CONCENTRATIONS OF 33 ug/kg AND 13 ug/kg, RESPECTIVELY. SAMPLES WERE COLLECTED FROM DIFFERENT DEPTHS AT THE SAME LOCATION.
ND	TCE WAS NOT DETECTED ABOVE THE DETECTION LIMIT.
NA	SAMPLE NOT ANALYZED.
NS	SAMPLE NOT COLLECTED.
MAX. CONC.	MAXIMUM DETECTED CONCENTRATION.
PRG	PRELIMINARY REMEDIATION GOAL.
DEPTH	DEPTH OF SOIL REMEDIATION.

NOTE:

1. **THE DELINEATED AREAS CONTAIN CONSTITUENT CONCENTRATIONS GREATER THAN THEIR PRGS.**

Figure 1-1
PROPOSED SOIL SAMPLE LOCATIONS
IN THE VICINITY OF THE BURNING GROUND
SITE 1 SOIL LEVEL DELINEATION
ALLEGANY BALLISTICS LABORATORY

CH2M HILL

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N

0 50 100 150

SCALE IN FEET

LEGEND

•15	TCE CONCENTRATION (ug/kg) IN SOIL SAMPLE. CONCENTRATION SHOWN IS HIGHER OF ONSITE AND OFFSITE ANALYSES, WHERE APPLICABLE.
O 2.1	TCE CONCENTRATION (ug/l) IN SOIL-GAS SAMPLE.
⊙ 17000 41000	TCE CONCENTRATION IN SOIL SAMPLE (ug/kg) AND SOIL-GAS SAMPLE (ug/l).
•140/91	SOIL SAMPLES CONTAIN TCE CONCENTRATIONS OF 140 ug/kg AND 91 ug/kg, RESPECTIVELY. SAMPLES WERE COLLECTED FROM DIFFERENT DEPTHS AT THE SAME LOCATION.
ND	TCE WAS NOT DETECTED ABOVE THE DETECTION LIMIT.
MAX. CONC.	MAXIMUM DETECTED CONCENTRATION.
PRG	PRELIMINARY REMEDIATION GOAL
DEPTH	DEPTH OF SOIL REMEDIATION.

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	17	0.152	0-6

NOTE:

1. THE DELINEATED AREAS CONTAIN CONSTITUENT CONCENTRATIONS GREATER THAN THEIR PRGS.

NORTH BRANCH POTOMAC RIVER

ALLEGANY COUNTY MARYLAND
MINERAL COUNTY WEST VIRGINIA

THIS SAMPLE WILL BE COLLECTED IN THE VICINITY OF SOIL SAMPLES COLLECTED DURING THE REMEDIAL INVESTIGATION AND EXHIBITING ELEVATED SVOC LEVELS

1GW1 · O ND · ND O · O 2.1 · ND O · ND/12 · ND/15 · ND · ND · ND · ND · O 65 · 1GW2 · 1GW12 · ⊙ 17000 (SOIL) 41000 (SOIL GAS) · 9.3 O · O ND · ND O · O ND · 1GW13 · 1GW9 · 1GW3 · 700

365 · 271 · GATE

LEGEND

△ PCB SOIL SAMPLE (COLLECTED 0.5-1 FOOT bgs) 373

X VOC SOIL SAMPLE (COLLECTED 2-3 FEET bgs)

Figure 1-2
PROPOSED SOIL SAMPLE LOCATIONS
IN THE VICINITY OF THE DRUM STORAGE
AND OPEN BURN AREAS
SITE 1 SOIL LEVEL DELINEATION
ALLEGANY BALLISTICS LABORATORY

CH2MHILL

13-OCT-1998 6193fc08.dgn

N

0 50 100 150

SCALE IN FEET

LEGEND

- •15 — TCE CONCENTRATION (ug/kg) IN SOIL SAMPLE. CONCENTRATION SHOWN IS HIGHER OF ONSITE AND OFFSITE ANALYSES, WHERE APPLICABLE.
- •110/370/2500 — SOIL SAMPLES CONTAIN TCE CONCENTRATIONS OF 110 ug/kg, 370 ug/kg, AND 2500 ug/kg, RESPECTIVELY. SAMPLES WERE COLLECTED FROM DIFFERENT DEPTHS, AT SAME LOCATION.
- ND — TCE WAS NOT DETECTED ABOVE THE DETECTION LIMIT.
- MAX. CONC. — MAXIMUM DETECTED CONCENTRATION.
- PRG — PRELIMINARY REMEDIATION GOAL.
- DEPTH — DEPTH OF SOIL REMEDIATION.

NOTE:

1. THE DELINEATED AREAS CONTAIN CONSTITUENT CONCENTRATIONS GREATER THAN THEIR PRGS.

CONSTITUENT	MAX. CONC. (PPM)	PRG (PPM)	DEPTH (FT)
TCE	2.5	0.152	0-6

ALLEGANY COUNTY MARYLAND
MINERAL COUNTY WEST VIRGINIA

NORTH BRANCH POTOMAC RIVER

110 •
100 •
280 •
•ND/220/190
1GW5
1GW14
130 △
710 •
• 110/370/2500
1GW8
48 •
20 •
20 •
119
75
291
GATE
GATE 7
(ABANDONED)
344
371
SEWAGE LIFT STATION
BARN

LEGEND

- △ PCB SOIL SAMPLE (COLLECTED 0.5-1 FOOT bgs)
- X VOC SOIL SAMPLE (COLLECTED 2-3 FEET bgs)
- ⊗ VOC SOIL SAMPLES (COLLECTED 2-3 AND 4-6 FEET bgs)

Figure 1-3
PROPOSED SOIL SAMPLE LOCATIONS
IN THE VICINITY OF THE INERT BURN AREA
SITE 1 SOIL LEVEL DELINEATION
ALLEGANY BALLISTICS LABORATORY

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